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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Yukitaka Seyama

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EXAMINER

MARKS, JACOB B

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

09/10/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/532,945	Applicant(s) SEYAMA, YUKITAKA	
	Examiner JACOB MARKS	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The Applicant's amendment filed on 05-21-2009 was received. Claims 1-12 are pending. Claims 1-12 have been amended.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on January 26, 2009.

Claim Rejections - 35 USC § 112

3. The Claim rejections under 35 U.S.C. 112 first paragraph of claims 1-12 are withdrawn in light of applicant's persuasive arguments.

4. The Claim rejections under 35 U.S.C. 112 second paragraph of claims 1-12 are withdrawn sua sponte. Although applicant failed to address the rejection under this section, it is the examiners position that the definition of Xmax is no longer indefinite.

Claim Rejections - 35 USC § 103

5. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al. (US Pat. No. 5,721,067), in view of Naruaki et al. (JP 2000-195558) on claims 1-7 and 12 are withdrawn in favor of new grounds of rejection. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al., in view of Naruaki and Shuji (JP 2000-067863) on claim 8 are withdrawn in favor of new grounds of rejection. The claim rejections under 35 U.S.C. 103(a)

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as being unpatentable over Jacobs et al., in view of Naruaki, Shuji, Daido et al. (US Pat. No. 6,818,352) on claims 9-11 are withdrawn in favor of new grounds of rejection.

6. Claims 1-7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al. (US Pat. No. 5,721,067) in view of Okada et al. (US 2002/0028379).

Regarding claims 1 and 12, Jacobs et al. teaches a nonaqueous electrolyte secondary battery which comprises a lithium-transition metal compound containing positive electrode (6) including an electrode made from the material $\text{Li}_x\text{Mn}_2\text{O}_4$. One of ordinary skill in the art would recognize that $\text{Li}_x\text{Mn}_2\text{O}_4$ has an inherently spinel structure (col. 4 lines 25-35). Jacobs et al. also teaches a lithium battery that has a negative electrode bearing carbonaceous materials (2) including graphite capable of storing and discharging lithium and a nonaqueous electrolyte (col. 6 lines 24-54). Jacobs et al. discloses that the ratio of the theoretical capacity of the negative electrode plate to the theoretical capacity of the positive electrode plate, defined as $R_{N/S}$ in the claim, may be between 0.85 and 1.15 (col. 3 line 49 – col. 4 line 7). Jacobs et al. does not teach a charging depth.

However, Okada et al. disclose a lithium ion battery with a carbon-based negative electrode represented by Li_xC_6 and a positive electrode that may be LiMn_2O_4 (par. 6, 29, 48). Okada et al. further discloses that the percent utilization of a carbon based electrode is less than 60% wherein $0 < x < 0.6$ for the Li_xC_6

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electrode structure (par. 6, 29, 48). Thus Okada et al. discloses that the maximum value of x (X_{\max}) is 0.6. Where the $R_{N/S}$ of Jacobs et al. is 0.9, Okada et al. satisfies the claimed equation for X_{\max} at condition 2. Okada et al. discloses that the percent utilization of the electrode does not exceed 60% because of safety considerations. Therefore, it would have been obvious to one of ordinary skill in the art to use the percent utilization of less than 60% in the battery of Jacobs et al. because Okada et al. teaches that exceeding this range is less safe.

Regarding claim 2, the combination of Jacobs et al. and Okada et al. would meet the limitation of condition 3 where the $R_{N/S}$ value of Jacobs et al. is 0.9.

Regarding claim 3, the combination of Jacobs et al. and Okada et al. disclose that X_{\max} is 0.6, which is less than 0.65 (Okada et al. par. 6, 29, 48).

Regarding claim 4, Jacobs et al. disclose that the $R_{N/S}$ value may be between 0.85 and 1.15 (col. 3 line 49-col. 4 line 7).

Regarding claim 5, Jacobs et al. teaches a lithium manganese oxide compound where the mole ratio of lithium to manganese may be between 0.5 and 0.63 (col. 4, lines 33-39).

Regarding claims 6 and 7, Jacobs et al. teaches that the lithium manganese oxide compound may contain other elements such as copper and chromium (col. 4 lines 33-39).

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7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al. and Okada et al. as applied to claims 1 and 7, further in view of Shuji (JP 2000-067863).

Regarding claim 8, the aforementioned prior art does not specifically teach the incorporation of mesophase pitch-based graphite within the disclosed device.

Shuji teaches using mesophase pitch-based graphite in a Lithium ion battery electrode (par. 15). Shuji teaches that mesophase pitch graphite is one of many materials that are suitable for use as the carbonaceous material in the electrode of a lithium ion battery (par. 15). The selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art. See, *In re Leshin*, 125 USPQ 416 (CCPA 1960); see also, MPEP § 2144.07). The motivation to make this modification would be to facilitate the materials intended use as a suitable electrode. Therefore, one of ordinary skill in the art would have found it obvious to use the mesophase pitch-based graphite of Shuji in the Lithium ion battery of Jacobs et al. because such graphite would have been suitable for such an electrode.

8. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al., Okada et al., and Shuji as applied to claims 1-8, further in view of Daido et al. (US Pat. No. 6,818,352).

Regarding claims 9 and 10, Daido teaches that the nonaqueous electrolyte solvent of a lithium ion battery may consist of vinylene carbonate (col. 12 lines 40-49). Daido teaches that such solvents are suitable for use as

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electrolytes in Lithium ion batteries. The selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960); see also MPEP § 2144.07). Therefore, one of ordinary skill in the art would have combined the vinylene carbonate electrolyte solvent of Daido with the Lithium ion battery of Jacobs et al. in order to obtain a suitable electrolyte solvent for the battery.

Regarding claim 11 none of Jacobs et al., Okada et al., Shuji, or Daido et al. teaches a specific concentration of the vinyl compound. However, Daido teaches that the electrolyte solvent may consist of vinylene carbonate. The concentration of the electrolyte solvent in a battery is a known result-effective variable. The discovery of an optimum value of a known result effective variable, without producing any new or unexpected results, is within the ambit of a person of ordinary skill in the art. See, *In re Boesch*, 205 USPQ 215 (CCPA 1980); see also, MPEP § 2144.05, II). Therefore, one of ordinary skill in the art would have found it obvious to use a vinyl compound concentration of between 0.0004 and 1.5 wt% because the vinyl compound is a known result-effective variable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACOB MARKS whose telephone number is (571)270-7873. The examiner can normally be reached on Monday through Friday 7:30-5:00 alt Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jacob Marks/

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795